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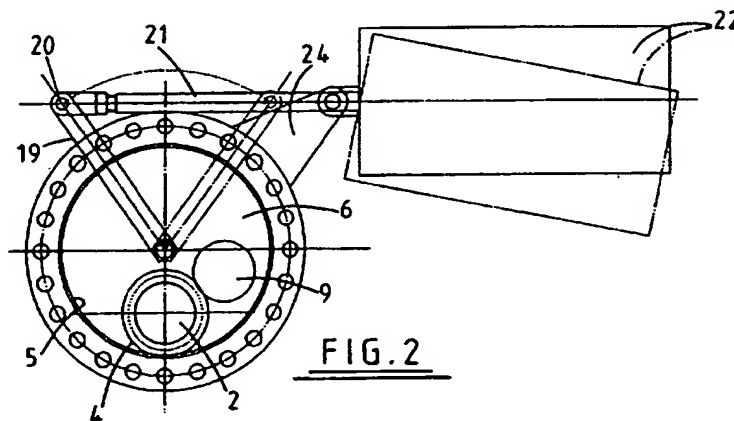
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(56) Documents Cited
GB 2277573 A US 4432387 A

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(54) A valve

(57) A valve comprises a body defining a flow passage 2 and a gate element movable between alternate positions in which it opens and closes the passage. The gate element is a circular plate 6 turntable about its centre so as to bring an eccentric flow opening 9 therein into and out of register with the flow passage. The circular plate 6 is centrally mounted for rotation on a shaft journaled on the body outside of the flow passage. Two or more flow openings may be provided in the circular plate.



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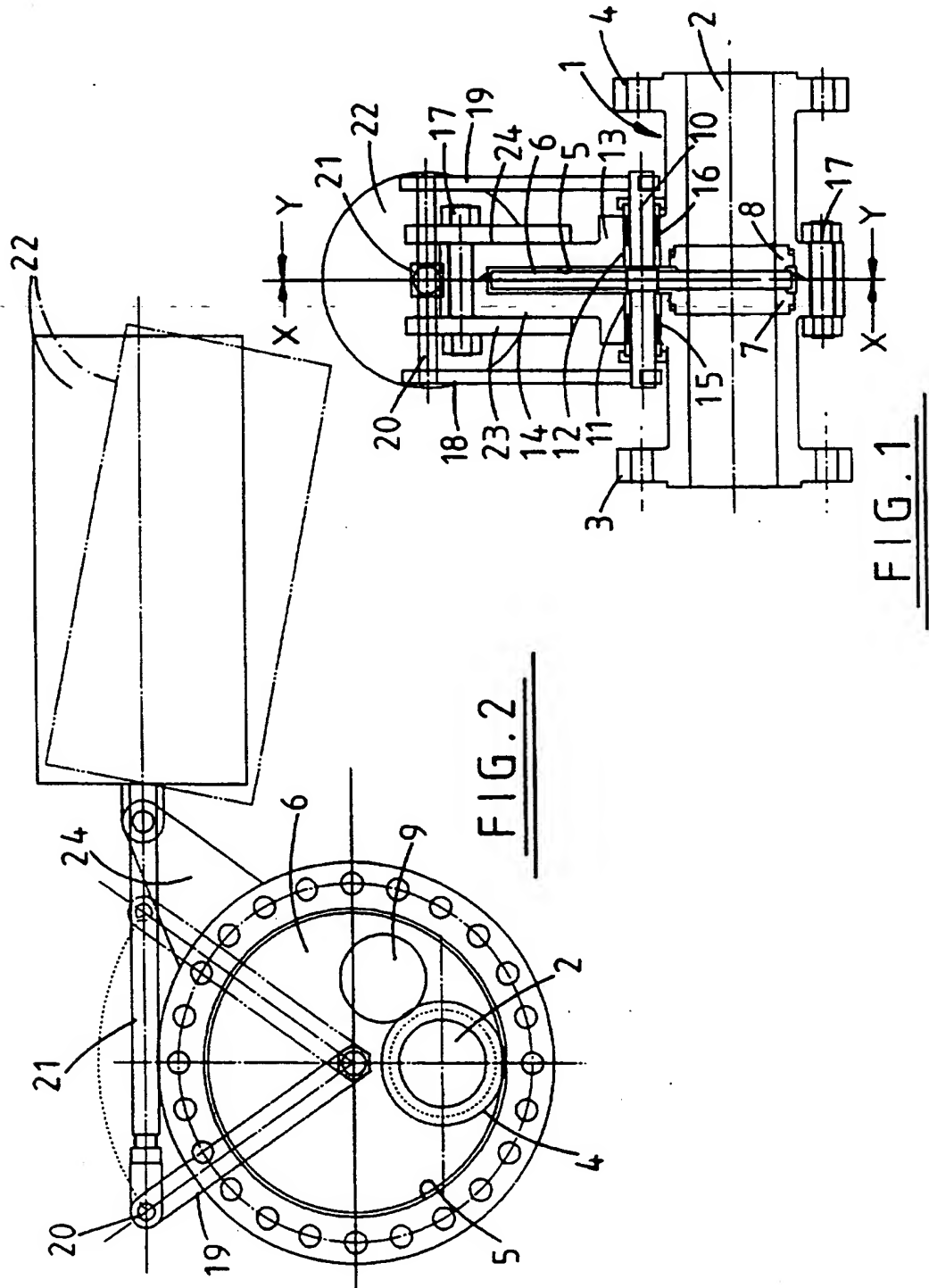


FIG. 1

FIG. 2

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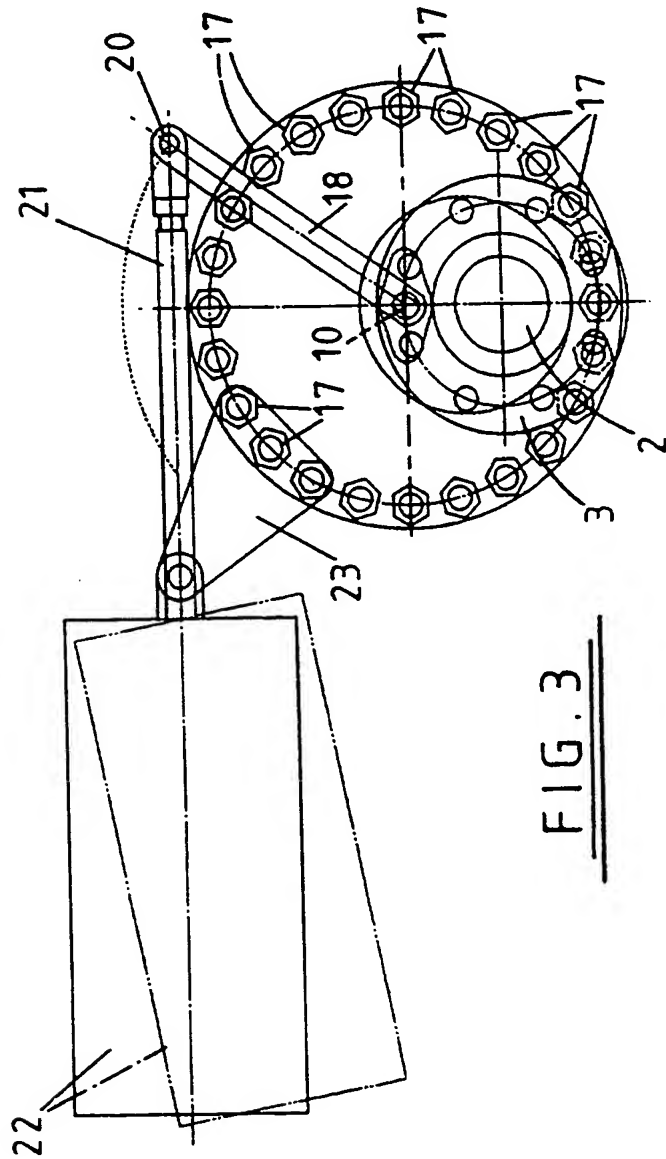


FIG. 3

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A VALVE

This invention relates to a valve comprising a body defining a flow passage and a gate element movable between alternate positions in which it opens and closes the passage.

It is known in a valve of this kind to provide a gate element in the form of a flat plate carried by an axially movable stem for displacing the plate between an open position in which an opening therein is in register with the flow passage and a closed position in which the opening is out of register with the passage. The gate element is accommodated in a body cavity which is required to have voids therein in order to permit displacement of the gate element. In certain applications of such valves, particularly in abrasive flow conditions, there is a likelihood of flow media setting in these internal voids.

It is an object of the invention to provide a valve of the kind described in which the aforesaid disadvantage is obviated or mitigated.

According to the present invention there is provided a valve comprising a body defining a flow passage and a gate element movable between alternate positions in which it opens and closes the passage characterised in that the gate element is a circular plate turnable about its centre so as to bring an eccentric flow opening therein into and out of register with the flow passage.

Preferably, the circular plate is centrally mounted for rotation with a shaft journaled on the body outside the flow passage.

The shaft preferably extends into respective bearings at opposite sides of the circular plate and stuffing boxes may be associated with said bearings.

Preferably, the shaft is turned by twin levers actuated by a pneumatic piston and cylinder arrangement carried by the body.

The circular plate is housed in a close-fitting cavity of corresponding shape provided in the body.

Preferably, two or more alternative flow openings are provided in the circular plate.

The invention will now be further described by way of example only, with reference to the accompanying drawings, in which:

Fig. 1 is a diagrammatic sectional view of one embodiment of the valve in accordance with the invention;

Fig. 2 is a sectional view in the direction of arrows Y, and

Fig. 3 is a sectional view in the direction of arrows X.

Referring now to the drawings, the exemplary valve comprises a valve body 1 with a straight-through flow passage 2 terminating in body flanges 3, 4. The body 1 is formed in two halves which are internally shaped at their adjacent ends to define a close-fitting cavity 5 housing a gate element in the form of a circular plate 6. The plate 6 extends transversely into the flow passage 2 between pairs of seats 7, 8 which are of conventional design and therefore not further described. An eccentric opening 9 (Fig. 2) of circular shape and size corresponding to the passage 2 is provided in the plate 6.

The plate 6 is centrally mounted on a shaft 10 for rotation therewith. The shaft 10 is journalled in bearings 11, 12 in a central bore of an enlarged hub 13 of a flat cylindrical collar 14 integral with the body 1 but eccentric with respect to the passage 2 so that the shaft 10 lies parallel to the passage 2 within the outer

diameters of the body flanges 3, 4. Stuffing boxes 15, 16 are associated with the bearings 11, 12 for sealing purposes. The collar 14 is provided by adjacent flanges of the body halves which are peripherally interconnected by fasteners 17.

The ends of the shaft 10 are fixed to inner ends of twin levers 18, 19 the outer ends of which are interconnected by a yoke 20 pivotally connected to a piston rod 21 of a pneumatic piston and cylinder actuator 22 pivotally mounted on twin brackets 23, 24 fixed to the body 1 by some of the collar fasteners 17. The actuator 22 is single acting with a spring return to provide an emergency closing function.

In Fig. 2, the valve is shown in the closed position with the eccentric opening 9 in the gate element provided by the circular plate 6 out of register with the flow passage 2. In this position the actuator rod 21 is fully extended. When the rod 21 is retracted to move the opening 9 through an arc of under 90° into register with the passage 2 the outer ends of the twin levers 18, 19 describe the curved path shown in dotted line and the cylinder of the actuator 22 pivots between the position shown in full and chain-dot line. Reverse movement of the actuator rod 21 moves the plate 6 back into the closed position.

It will be noted particularly in Figs. 1 and 2 that there is only small clearance between the circular gate element 6 and the housing 5. Moreover, because of the circular shape of the gate element 6 and the fact that it is turned about its centre the gate element is not displaced bodily in space as is the case with the conventional gate elements described above. The need for voids in the housing is therefore obviated and setting of flow media in the gate housing is thereby avoided.

It will be appreciated that numerous modifications are possible without departing materially from the scope of the invention as defined in the appended claims. For example, the valve body need not have a straight-through flow passage or flange connections at the outer ends thereof. Thus the inlet may be out of line with the outlet and the ends of the body may be welded into a pipeline. Two or more openings 9 may be provided in the circular plate 6. In the case of two openings the openings may be diametrically opposed; three or more openings would be equiangularly spaced. The benefit of additional openings is that wear on the plate 6 caused by frictional contact with the seats 7, 8 can be compensated by disassembling the valve, repositioning the plate 6 to bring another opening into an operative position, and then reassembling the valve.

CLAIMS:

1. A valve comprising a body defining a flow passage and a gate element movable between alternate positions in which it opens and closes the passage characterised in that the gate element is a circular plate turnable about its centre so as to bring an eccentric flow opening therein into and out of register with the flow passage.
2. A valve as claimed in claim 1, wherein the circular plate is centrally mounted for rotation with a shaft journalled on the body outside the flow passage.
3. A valve as claimed in claim 2, wherein the shaft extends into respective bearings at opposite sides of the circular plate.
4. A valve as claimed in claim 3, wherein stuffing boxes are associated with said bearings.
5. A valve as claimed in claim 3 or 4, wherein the shaft is turned by twin levers actuated by a pneumatic piston and cylinder arrangement carried by the body.

6. A valve as claimed in any one of the preceding claims, wherein the circular plate is housed in a close-fitting cavity of corresponding shape provided in the body.

7. A valve as claimed in any one of the preceding claims, wherein two or more alternative flow openings are provided in the circular plate.

8. A valve substantially as herein described with reference to the accompanying drawings.



Application No: GB 9508628.6
Claims searched: 1 - 8

Examiner: Roger Casling
Date of search: 20 August 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.O): F2V(VP16)

Int CI (Ed.6): F16K

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2277573 A (FSSL Limited) see page 3 line 19 et seq and page 5 line 14 et seq	1,2,6 and 7 at least
X	US 4432387 (SIMS) see 2 line 41 to 4 line 68	1,2,6 and 7 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
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